



# EFV Open Systems Review



*Brief to the Modular Systems  
Approach Review Team*  
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**APM (C)/CIO**



EFV-C



EFV-P



# Purpose

- Present an overview of the operational view and programmatic schedule for the EFV program.
- Present the EFV program's incorporation of an open systems architectural approach.
- Present EFV findings and recommendations given to OUSD AT&L (Open Systems Team) on the MOSA PART and process.



# EFV-P MISSION

**Provide High Speed  
Transport of Embarked  
Marine Infantry From  
Ships Located Beyond  
the Horizon to Inland  
Objectives**



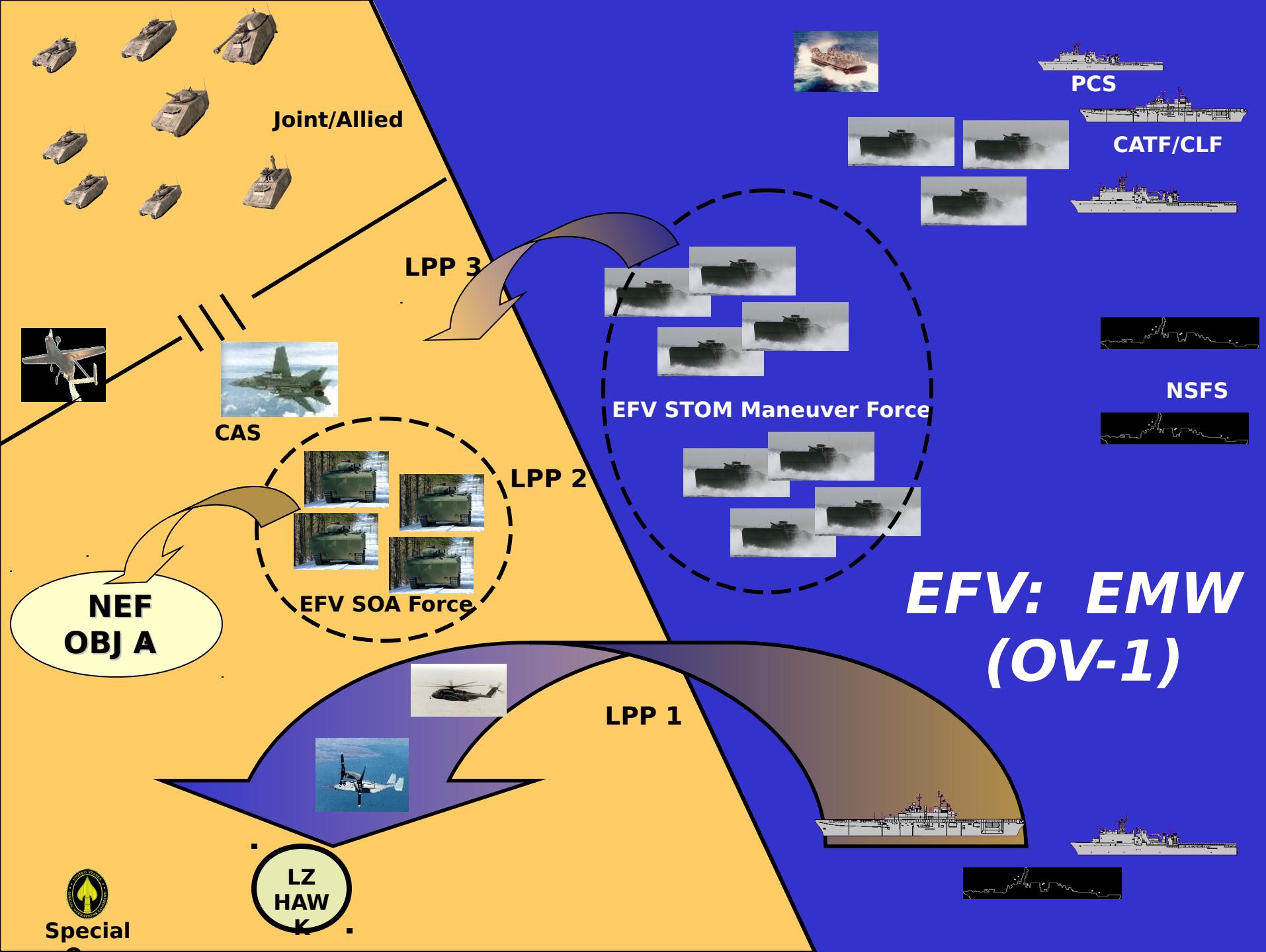
**Provide Armor  
Protected Land  
Mobility and Direct  
Fire Support During  
Combat Operations**



# EFV- C Mission

- The EFV - C shall enable the embarked Infantry Battalion and/or Regimental Commander and his staff members to function as an Infantry Battalion or Regimental Tactical Echelon Command Post while on the move.



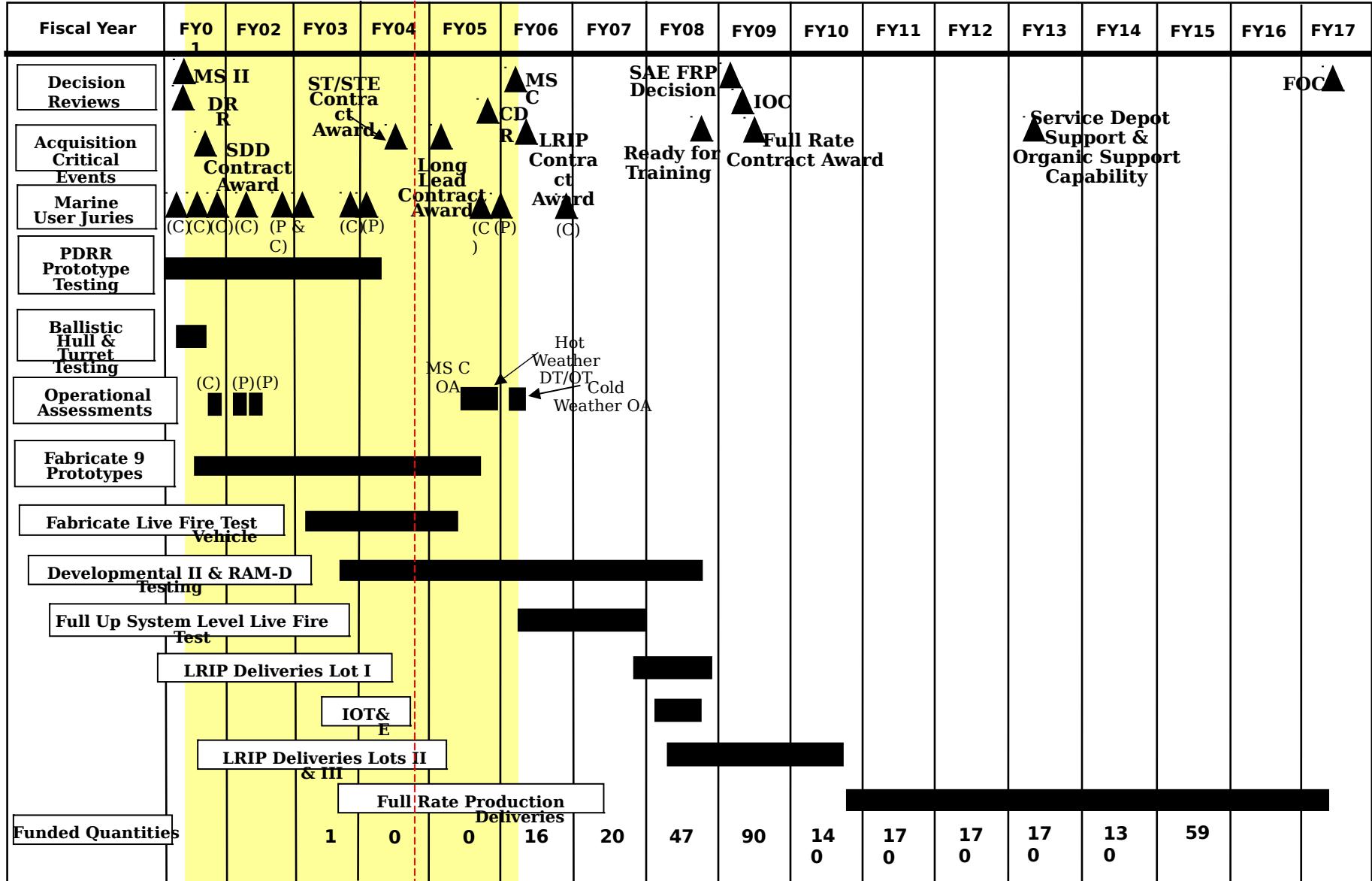




# EFV PROGRAM SCHEDULE



**Today**





# EFV C4I Integration

## An Open Systems Approach



- **Challenges**

- EFV must perform under extreme environmental conditions (heat/cold/shock/vibration/seawater/NBC, etc.).
- C4 System requirements
  - Pace of change
  - Hardware/software development

- **Approach**

- Open systems architecture contractually and technically directed
- Host fielded C2 Systems
  - AFATDS, IOS, C2PC, SINCGARS, Antennas, PSC-5D, EPLRS, VIC-3, Meshnet, etc.
- Use of COTS boards via implementation of Spraycool technology
- Planned COTS refresh every 3 years for C4 HW
- EFV open system architecture approach facilitates integration within the NCES (GIG) operational concept.
- EFV software development is accomplished through COTS products.
  - Rational SW Development Tool
    - MPA, FC
  - Windows OS
    - DPU, CDP
  - Visual Basic
    - GUI development (C&D)



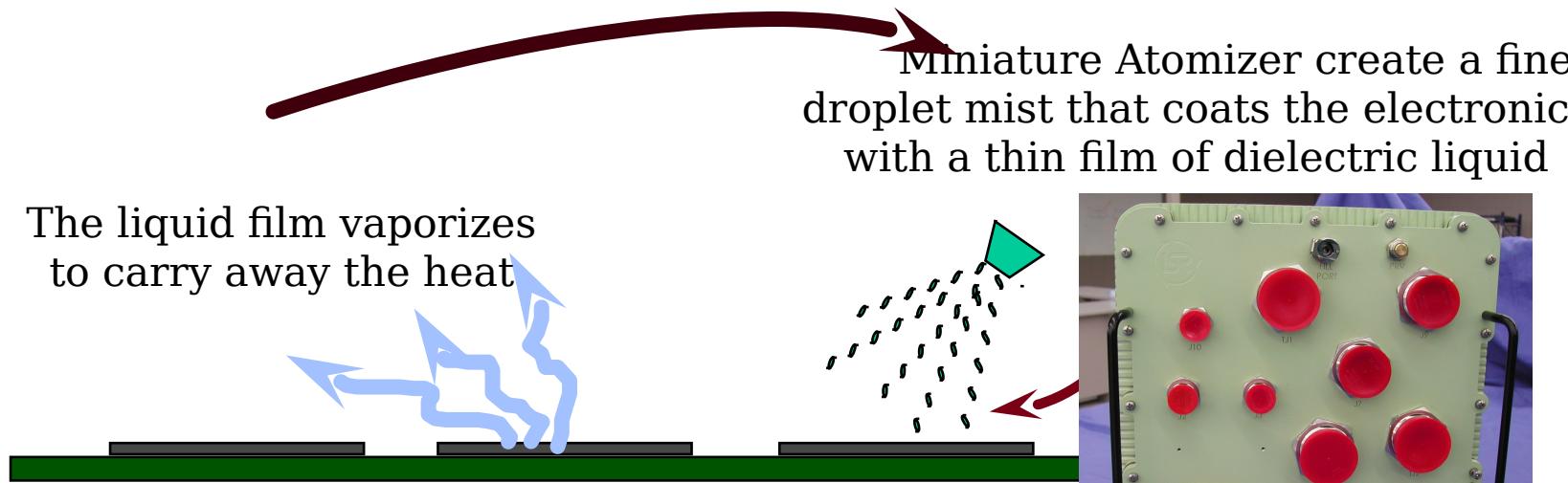
# Spray Cool

## An Open Systems HW Solution



**Spray cooling is the most efficient form of heat transfer!**

The vapor is then condensed in an ambient heat exchanger  
that is optimized for the specific environment  
and the liquid is pumped back to the atomizers in a closed-system



***Spray Cool is an SBIR activity that has transitioned to Phase III***





# EFV SDD Spray Cool MPU

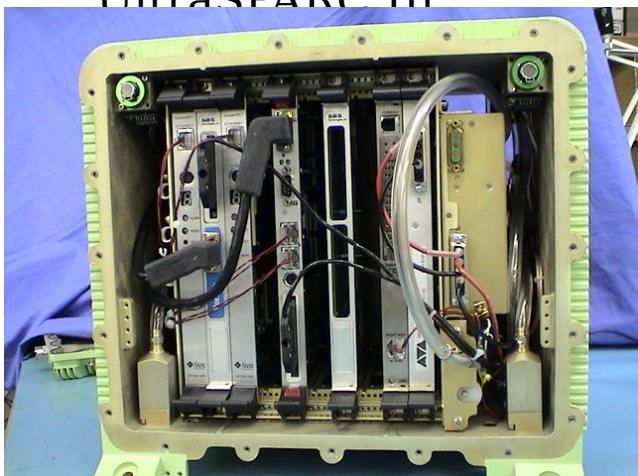


## AFATDS Server (Solaris 2.7)

- SUN CP-1500 440MHz UltraSPARC IIi
- SBS Technologies CP-613 carrier board
  - Raytheon SP-TCIM/TACLINK 3000

## IOS Server - V3.0 (Solaris 2.5.1)

- SUN CP-1500 440MHz UltraSPARC IIi



## 9-Slot cPCI - v6.3.2

## TDN/C2PC/Video Server - V5.9.0.4 (Windows NT)

- Teknor Dual Pentium 700 MHz SBS Technologies
  - Raytheon SP-TCIM/TACLINK 3000
- CP-613 carrier board
  - Leutrek Vision Inc. PMC Video Capture Card
  - SBS Technologies MIP Serial Octal Card
- Performance Technologies Ethernet Switch

Dimensions:

15.0 W × 13.6 H × 13.2 D  
(inches)

Weight: 75 lbs



# MOSA PART Validation

## *OSJTF's Expected Feedback from EFV*

- **MOSA PART answers, rationale, explanations**
- **Mechanism Feedback**
  - How user-friendly/intuitive is the tool?
  - How well do the instructions explain the proper use of the tool?
  - How long did it take to complete the questionnaire?
- **Content Feedback**
  - How well do the questions provide an appropriate level of detail/coverage for a valid assessment of your MOSA?
  - How well does the supporting criteria provide additional insight into the questions and the expected level of detail for your rationale & explanations for each question?
  - How well do the questions match their corresponding sections?
  - How well does the assessment summary report provide a clear understanding of your score?



# EFV Observations

## MOSA PART Review

- The PART questions, even though broken into business and technical areas, are reiterative.
  - Supporting EFV documentation to support OSA implementation are used between the areas, e.g. SOW, S/SS, AMP/ASR.
- The explanation against each question is adequate and informative, but only provides a “pop-up” guidance against the “Very Large Extent” entry.
  - Understanding that even with supporting data, the questions are subjective, further clarity is needed to note what differentiates “To Some Extent” To a Large Extent” entries.
- The interface was unwieldy.
  - A “locking” of the Question column would allow the respondent to quickly refer to the question, remarks and supporting data columns simultaneously.
- To be effective the PART must be injected in the early stages of design/programmatic activity.
  - As programs get closer to LRIP design, a directed MOSA implementation may be too costly or may impact schedule. Instead of helping, an implementation of MOSA activity my be detrimental.
- In the overview of the PART, it is noted that the program allows for adjustment of the assessment weighting.
  - Prior to starting the review process the program and the MOSA team must determine together the weighting factors prior initiating the PART review
- The actual man hours to complete the PART: @ 20-30 hours



# Results of EFV MOSA Assessment

**Rating** - “Satisfactory” MOSA Implementation

## **Strong Points**

- MOSA planning evidenced by proper MOSA language in the Program Acquisition Strategy
- Assigning the MOSA implementation responsibility to an IPT
- Inserting proper MOSA language in the EFV contracting documents
- Emphasizing the use of modular design approaches

## **Room For Improvement**

- Providing evidence of the use of open standards for key interfaces, and
- Ensuring that the standards used in the modules connected by such interfaces conform to widely-supported and consensus-based standards

## **Recommendations**

- Program should verify and document the existence of open standards for key system interfaces through appropriate mechanisms such as:
  - Conformance testing, and
  - Substitution of system components with similar components from competitive sources